

IN THE DRAWINGS

The attached sheet of drawings includes changes to Figure 5, and this sheet replaces the original sheet including Figure 5. Figure 5 has been labeled --Prior Art--.

Attachment: Replacement Sheet

REMARKS

Claims 1-9 are pending in this application. Claims 1-3 and 5-7 have been amended.

Claims 1, 2, and 7 are independent.

At paragraph 2 of the Office Action, the Examiner objected to the declaration as being defective, and required a new declaration. In particular, the Examiner states that the declaration is defective because, on pages 1 and 2, the word “January” has been misspelled (as “Junuary”), in identifying the priority applications.

While the word “January” was in fact misspelled, due to an error in translating from the Japanese language to the English language, Applicant can find no rule or regulation (including in MPEP 602.01 and 602.02, cited by the Examiner) that states that such a typographical error renders the declaration “defective.” Moreover, the official Filing Receipt issued by the USPTO properly lists the dates of the priority applications. Accordingly, withdrawal of the objection to the declaration is respectfully requested.

At paragraphs 3-5 of the Office Action, the Examiner objected to the drawings for the reasons provided.

In particular, at paragraph 3, the Examiner states that in Figure 2, the lead lines for reference elements L and D₃ should not cross each other. However, it is submitted that the lines for reference elements L and D₃ are not “lead lines” but instead are for showing certain distances and diameters in order to aid in the understanding of the subject matter to be patented. Accordingly, withdrawal of this objection is respectfully requested.

At paragraph 4, the Examiner states that the drawings must show every feature of the invention specified in the claims, and that, therefore, the concave inner surface having a bottom edge must be shown or the feature(s) canceled from the claims. However, it is

submitted that this feature is in fact shown in the drawings. Specifically, the concave inner surface is shown in the drawings, for example, in Fig. 2 by reference numeral 34, and its bottom edge is shown by reference numeral 34a.¹ Accordingly, withdrawal of this objection is respectfully requested.

At paragraph 5, the Examiner requires that Figure 5 be designated by the label "Prior Art." Applicant has complied with this request, and submitted herewith is a replacement sheet of drawing in which Figure 5 has been so labeled. Withdrawal of this objection is respectfully suggested.

For all the above reasons, withdrawal of the objection to the drawings is respectfully requested.

At paragraphs 7 and 8 of the Office Action, the specification was objected to for the informalities noted. The specification and abstract have been amended accordingly and, therefore, withdrawal of the objection to the specification is respectfully requested.

Paragraphs 9-13 of the Office Action set out various informalities relating to claims 1-3 and 5-7. Those claims have been amended with particular attention to the points raised in the Office Action. Accordingly, withdrawal of the objections to claims 1-3 and 5-7 is respectfully requested.

Claims 1-9 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. The claims have been carefully reviewed and amended as deemed necessary to ensure that they conform fully to the requirements of Section 112, second paragraph, with special attention to the points raised in paragraph 15 of the Office Action.

¹It is of course to be understood that the references to various portions of the present application are by way of illustration and example only, and that the claims are not limited by the details shown in the portions referred to.

In particular, claims 1, 2, and 7 recite that “the curved part has a curved outer surface and a concave inner surface.” The Examiner asks: “Outer and inner with respect to what axis and in what manner?” The Examiner’s attention is directed to, e.g., Fig. 2, which shows curved part 32 having an outer surface 31 and a concave inner surface 34 with respect to the axis m of the tube 20. See also page 5, lines 29-31 of the present specification. Claims 1, 2, and 7 have been clarified accordingly.

Claim 2 recites that “the curved outer surface has a center of curvature at a position on the radially outer side of the bottom edge of the concave inner surface.” The Examiner asks: “What does Applicant mean by this statement?” The Examiner’s attention is directed to, e.g., Fig. 2, which shows curved outer surface 31 having a center P of curvature at a position on the radially outer side of the bottom edge 34a of the concave inner surface 34 with respect to the axis m of the tube 20. See also page 5, line 36, to page 6, line 2 of the present specification. Claim 2 has been clarified accordingly.

It is believed that the rejection under Section 112, second paragraph, has been obviated, and its withdrawal is therefore respectfully requested.

Claims 1-5 were rejected under 35 U.S.C. 102(b) as being anticipated by European Patent Application No. EP 1,236,946 A1 to Stahn. Claims 6-9 were rejected under 35 U.S.C. 103(a) as being obvious from Stahn.

Applicants submit that independent claims 1, 2, and 7, together with the claims dependent therefrom, are patentably distinct from the cited reference for at least the following reasons.

Claim 1 is directed to a flared end structure of a metal tube to be pressed against a seat formed in a member by tightening a coupling nut to the member. The flared end structure has

a joining end part to be pressed against the seat of the member, and a curved part continuous with the joining end part. The curved part has a curved outer surface with respect to the axis of the tube and a concave inner surface having a bottom edge. The curved outer surface has a radius of curvature smaller than a wall thickness of the metal tube so as to increase a rigidity of the flared end structure.

One notable feature of claim 1 is that a curved outer surface of a curved part of a flared end structure of a metal tube has a radius of curvature smaller than the wall thickness of the metal tube so as to increase the rigidity of the flared end structure. By virtue of the features of claim 1, which, as noted, defines the shape of a flared end structure of a metal tube so as to increase its rigidity, high sealing ability at the connected portion of the metal tube can be attained.

In contrast, Stahn merely discusses the connected structure of two tubes having a conventional flared end structure. There is nothing in Stahn that would teach or suggest the shape of a flared end structure as recited in claim 1. In fact, paragraph 0007 of Stahn states that a conventional flared end structure is acceptable, in stating that "[t]he manufacture of the tube installation in accordance with the invention is moreover identical for the user to previously know tube installations in which the corresponding flares abut directly against one another."

Furthermore, paragraph 0029 of Stahn states, regarding deformation of a flared end structure, that "the flares 32 and 34 are deformed, that is to say basically elastically, when the female tube nut 24 and the male tube nut are tightened together." (Emphasis added.) And at paragraph 0018, Stahn states: "In this way the elastic properties of the tubes and the corresponding flares are utilized particularly well for form a seal between flare and

intermediate element." Therefore, Stahn intends to improve seal ability by using conventional elastic deformation of a conventional flared end structure.

The flared end structure of claim 1, in stark contrast, intends to improve sealing ability by increasing the rigidity of the flared end structure. More specifically, in claim 1, in order to increase the rigidity of the flared end structure, the relation between factors such as a wall thickness t and a radius R of curvature, etc. (see, e.g., Fig. 2 of the present application) is specified, as recited in the claim. Nothing in Stahn would teach or suggest improving sealing ability by increasing the rigidity of the flared end structure, as in claim 1.

In this regard, Applicant notes the description in the present application from page 1, line 34, to page 2, line 16:

"[T]he flared end structure 12 of the prior art flared type pipe joint is elastically deformed to make the flared end structure 12 come into close contact with the seat 13 by its resilience. Therefore, if the coupling nut 15 is screwed excessively on the externally threaded end of the nipple 11, the area of contact between the flared end structure 12 and the seat 13 increases and, consequently, contact pressure decreases and the sealing effect of the flared type pipe joint decreases. Thus, the sealing ability of the prior art flared type pipe joint is dependent on the degree of tightening the coupling nut 15 and the sealing effect of the prior art flared type joint is insufficient for high-pressure piping... Accordingly, it is an object of the present invention to provide a flared end structure of a tube capable of solving the foregoing problems in the prior art, of providing a high sealing effect without being elastically deformed and of being easily formed. (Emphasis added.)

Claim 1 recites, *inter alia*, "the curved outer surface has a radius of curvature smaller than a wall thickness of the metal tube," which contributes to increased rigidity of the flared end structure. Claim 1 has been clarified to even further emphasize this feature. While the Office Action, at page 8, refers to Fig. 1 of Stahn, the relative sizes for each portion or element pointed to in that figure is not specified in Stahn. Nothing in Stahn would teach or suggest that a curved outer surface of a curved part of a flared end structure of a metal tube

has a radius of curvature smaller than the wall thickness of the metal tube so as to increase the rigidity of the flared end structure, as recited in claim 1.

Accordingly, claim 1 is seen to be clearly allowable over Stahn. Independent claim 2 has also been amended to clarify that the claimed structure of the flared end structure increases its rigidity, and, therefore, claim 2 is also seen to be clearly allowable over Stahn.

With respect to independent claim 7, the Examiner concedes that Stahn does not disclose that “a distance including a tolerance between the flat surface of the neck part and the end of the joining end part of the metal tube meets” the inequality recited in claim 7. Nevertheless, the Examiner asserts that this feature would have been obvious “because a change in the size of a prior art device is a design consideration within the skill of the art” and “because the optimization of proportions in a prior art device is a design consideration within the skill of the art.”

However, the Examiner’s statements are merely conclusory. The present application at, e.g., page 9 explains that the inequality recited in claim 7 can improve rigidity and processing facility. The Examiner’s statements do not support a finding of *prima facie* obviousness because they do not establish that the features of claim 7 are taught or suggested by the prior art. MPEP 2142 provides, with respect to establishing a *prima facie* case of obviousness, that “[t]he key to supporting any rejection under rejection under 35 U.S.C. 103 is the clear articulation of the reason why the claimed invention would have been obvious.” Such clear articulation is not present in the Office Action, which instead contains mere conclusory statements. However:

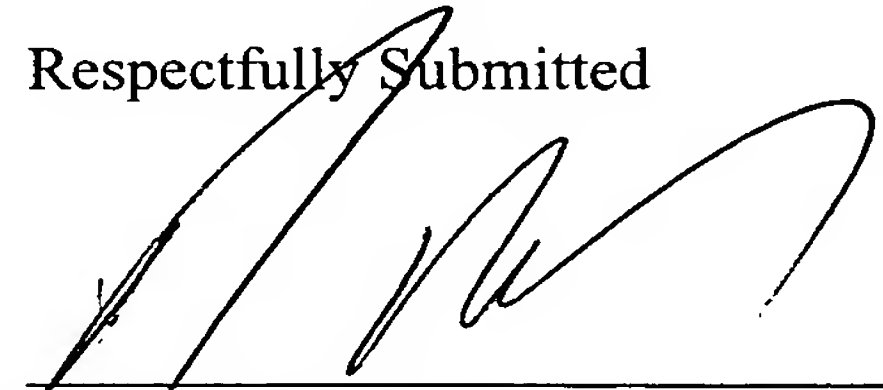
... [R]ejections on obviousness cannot be sustained by mere conclusory statements; instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. MPEP 2141.III, quoting *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, 82 USPQ2d 1385, 1396 (2007).

Accordingly, claim 7 is seen to be clearly allowable over Stahn.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration or reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Respectfully Submitted



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